MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2019/2020

BDS2074 – MANAGEMENT DECISION SCIENCE

(All sections / Groups)

11 MARCH 2020
9.00 a.m – 11.00 a.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **FOUR (4)** printed pages excluding cover page.
2. Answer **ALL FOUR (4)** questions.
3. Please write all your answers in the Answer Booklet provided.

QUESTION 1 (25 MARKS)

(a) Irwin Textile Mills produces two types of cotton cloth – denim and corduroy. Corduroy is a heavier grade of cotton cloth. It requires 7.5 pounds of raw cotton per yard whereas denim requires 5 pounds of raw cotton per yard. A yard of corduroy requires 3.2 hours and a yard of denim requires 3 hours of processing time. The demand for denim is practically unlimited but the maximum demand for corduroy is 510 yards per month. The manufacturer has 6 500 pounds of cotton and 3 000 hours of processing time available each month. The manufacturer makes a profit of $2.25 per yard of denim and $3.10 per yard of corduroy. The manufacturer wants to know how many yards of each type of cloth to produce in order to maximize profit.

i) Formulate the above problem as a Linear Programming Model.

(4 marks)

ii) Develop an initial simplex tableau by including the necessary slack variables.

(6 marks)

(b) A transport company has four trucks located at four different factories. The trucks are to be moved to four different sites. The distance, in kilometers, between the various trucks and sites are given in the following table:

Truck	Site			
	S1	S2	S3	S4
A	44	44	41	43
B	41	47	42	42
C	40	43	44	46
D	46	44	45	43

How should the trucks be moved to the sites in order to minimize the total distance travelled?

(15 marks)

Continued...

QUESTION 2 (25 MARKS)

Mancho Company manufactures electric fans at three factories: A, B and C to meet the demand of three major distributors at X, Y and Z. The transportation cost in MYR, the number of supplies and the number of demands are provided as below:

Factory	Distributor			Supply
	X	Y	Z	
A	6	4	5	200
B	8	6	7	300
C	5	5	6	300
Demand	400	200	100	

Determine the optimum transportation table and state the minimal of transportation cost.

Continued...

QUESTION 3 (25 MARKS)

The American Bank is planning to install a new computerized accounts system. Bank management has determined the activities required to complete the project, the precedence relationships of the activities and activity time estimates, as shown in the following table:

Activity	*Immediate Predecessors*	*Time Estimates (Days)*		
		Optimistic	*Most Likely*	*Pessimistic*
A	-	19	25	31
B	-	16	23	30
C	-	25	40	55
D	A	21	30	45
E	D	12	21	30
F	B,E	9	17	25
G	B,C	6	12	18

(a) Calculate the expected duration time for each activity.

(4 marks)

(b) Construct a drawing of appropriate network for above listed activities.

(4 marks)

(c) State the critical path and the expected completion time of the project. Determine the earliest start time, latest start time, earliest finish time, latest finish time and slack time.

(17 marks)

Continued...

QUESTION 4 (25 MARKS)

Microcomp is a United of States based manufacturer of personal computers. It is planning to build a new manufacturing and distribution facility in either South Korea, China, Taiwan, Philippines or Mexico. It will take years to build the necessary infrastructure to construct the new facility and put it into operation. The company has estimated the payoff in each country under three different economic climates:

Country	Economic Climate		
	Decline	Maintain	Improve
South Korea	$21 700	$19 100	$15 200
China	$19 000	$18 500	$17 600
Taiwan	$19 200	$17 100	$14 900
Philippines	$22 500	$16 800	$13 800
Mexico	$25 000	$21 200	$12 500
Probabilities	**0.2**	**0.5**	**0.3**

(a) Which country should Microcomp select if they expect their profit in a long term duration?

(6 marks)

(b) Microcomp believes that there is only 83% chance of success for each alternative. Which country do you recommend to build the facility?

(5 marks)

(c) Which country will be the best if Microcomp believes that there is an equally likely chance for success?

(4 marks)

(d) Determine the best country to build the facility through Expected Opportunity Loss (EOL) criterion.

(6 marks)

(e) State the best decision based on an optimist character.

(4 marks)

End of Questions.